STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 96-078

APPROVAL OF AN AMENDMENT OF THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS

WHEREAS:

1. The Central Valley Regional Water Quality Control Board (CVRWQCB) adopted the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) on December 9, 1994 under Resolution No. 94-380.

2. On May 3, 1996 following a public hearing, the CVRWQCB adopted Resolution No. 96-147 (attached) which amends the Basin Plan by regulating agricultural subsurface drainage discharges to Grassland Watershed surface waters and the Lower San Joaquin River.

3. The State Water Resources Control Board (SWRCB) finds that there is substantial evidence to show that the proposed amendment complies with the requirements of Section 13241 of the California Water Code (CWC) and SWRCB Resolution No. 68-16 (antidegradation policy).

4. Section 13240 of the CWC specifies that Basin Plans be periodically reviewed and, if appropriate, revised.

5. The CVRWQCB staff prepared documents and followed procedures satisfying environmental documentation requirements in accordance with the California Environmental Quality Act and other State laws and regulations.

6. This Basin Plan amendment does not become effective until approved by the SWRCB and until regulatory provisions are approved by the Office of Administrative Law (OAL).

THEREFORE BE IT RESOLVED THAT:

The SWRCB:

1. Approves CVRWQCB Resolution No. 96-147 amending the Comprehensive Water Quality Control Plan for the Central Valley Region for regulating agricultural subsurface drainage discharges to Grassland Watershed surface waters and the lower San Joaquin River.

2. Authorizes the SWRCB staff to submit the approved revised Basin Plan amendment to the U.S. Environmental Protection Agency and regulatory provisions to the OAL for approval.

3. Within three years after the Department of Fish and Game (DFG) notifies the CVRWQCB that specific water bodies support threatened or endangered species listed pursuant to the California Endangered Species Act, and that scientific evidence indicates that certain existing water quality objectives for these water bodies do not adequately protect such species, the CVRWQCB shall determine, in consultation with DFG, whether these objectives are adequately protective. In cases where such existing objectives do not provide adequate protection for such threatened and endangered species, the CVRWQCB shall develop and adopt adequately protective site-specific objectives for these constituents.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 19, 1996.

Maureen Marché

Maureen Marché
Administrative Assistant to the Board

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO. 96-147

AMENDING THE WATER QUALITY CONTROL PLAN
FOR
THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS
TO ADDRESS THE CONTROL OF AGRICULTURAL SUBSURFACE DRAINAGE

WHEREAS, The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) adopted the third edition of the Water Quality Control Plan (hereafter Basin Plan) for the Sacramento River and San Joaquin River Basins on 9 December 1994; and

WHEREAS, The State Water Resources Control Board (hereafter State Board) approved the Basin Plan on 16 February 1995; and

WHEREAS, The Office of Administrative Law (OAL) approved the Basin Plan on 9 May 1995; and

WHEREAS, The U.S. Environmental Protection agency disapproved some of the selenium objectives in the Basin Plan and promulgated selenium criteria in accordance with Section 303 of the Federal Clean Water Act; and

WHEREAS, It is the Board's responsibility to establish water quality objectives in the Basin Plan; and

WHEREAS, The Basin Plan may be amended in accordance with Section 13240, et seq., of the California Water Code; and

WHEREAS, The Board has prepared an amendment to the Basin Plan which designates beneficial uses, adopts selenium water quality objectives, and adopts a program of implementation for those objectives; and

WHEREAS, The Board circulated drafts of the proposed amendments and held workshops to hear testimony regarding the proposals on 23 June 1995, 22 September 1995, and 7 December 1995; and

WHEREAS, The Board has prepared and circulated a report titled *Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Agricultural Subsurface Drainage Discharges*, dated March 1996, (hereafter Staff Report); and

SUMMARY OF NEW REGULATORY PROVISIONS

The Central Valley Regional Water Quality Control Board adopted amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins on 3 May 1996. These amendments were adopted to update the regulatory programs for control of agricultural subsurface drainage discharges to the San Joaquin River basin. This amendment contains a number of regulatory provisions that modify existing provisions and these provisions are summarized as follows:

1. Prohibitions - A number of prohibitions were instituted in order to control new sources of agricultural subsurface drainage, protect sensitive beneficial uses from elevated levels of selenium, and to ensure compliance with water quality objectives for selenium by the compliance time frame identified on Table IV-4 of the amendment. These prohibitions are summarized as follows:

   a. New Agricultural subsurface drainage discharges from the Grassland watershed are prohibited unless discharge is governed by a waste discharge requirement;

   b. Discharge of agricultural subsurface drainage is prohibited to the wetland supply channels and Salt Slough after 1 October 1996, unless water quality objectives for selenium are being met;

   c. Discharge of agricultural subsurface drainage is prohibited to Mud Slough (north) and the San Joaquin River upstream of Sack Dam to the mouth of the Merced River after 1 October 2010, unless water quality objectives are being met;

   d. Discharge of selenium from agricultural subsurface drainage from the Grassland watershed to the San Joaquin River is prohibited in excess of 8,000 pounds per year, beginning from 1 October 1996.

2. Water Quality Objectives - Selenium water quality objectives were adopted to conform with the USEPA promulgation in 1992. A water quality objective for selenium of 5 $\mu g/L$, based on a 4-day average total recoverable selenium, is instituted for Mud Slough (north) and the San Joaquin River from Sack Dam to Vernalis. A 2 $\mu g/L$ selenium water quality objective based on a monthly average total recoverable selenium is instituted for Salt Slough and the Grassland channels identified in Appendix 40 (wetland water supply channels).

3. Implementation - A compliance schedule was developed that will guide progress toward achievement of water quality objectives by the compliance date. Performance goals will be used to measure this progress. Selenium load limits will be incorporated into waste discharge requirements as effluent limits, to ensure compliance with selenium water quality objectives in the San Joaquin River. Contributors to the generation of agricultural subsurface drainage will submit for approval a short -term (5-year) and a long-term drainage management plan designed to meet the performance goals and the water quality objectives, respectively. These parties will also conduct annual evaluations of the effectiveness of the control actions.

Note: New text of Regional Board adopted basin plan amendment is highlighted. New regulatory provisions are underlined.

BASIN DESCRIPTION

This Basin Plan covers the entire area included in the Sacramento and San Joaquin River drainage basins (see maps in pocket* and Figure II-1). The basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend some 400 miles from the California - Oregon border southward to the headwaters of the San Joaquin River.

*NOTE: The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin follows the northern boundary of Little Panoche Creek basin, continues eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then follows along the southern boundary of the San Joaquin River drainage basin.

The Sacramento River and San Joaquin River Basins cover about one fourth of the total area of the State and over 30% of the State's irrigable land. The Sacramento and San Joaquin Rivers furnish roughly 51% of the State's water supply. Surface water from the two drainage basins meet and form the Delta, which ultimately drains to San Francisco Bay. Two major water projects, the Federal Central Valley Project and the State Water Project, deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay area, as well as within the Delta boundaries.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. The legal boundary of the Delta is described in Section 12220 of the Water Code (also see Figure III-1 of this Basin Plan).

Ground water is defined as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. Where ground water occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs, it can be defined as an aquifer (USGS, Water Supply Paper 1988, 1972). A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers (Todd, *Groundwater Hydrology*, 1980).

Major ground water basins underlie both valley floors, and there are scattered smaller basins in the foothill areas and mountain valleys. In many parts of the Region, usable ground waters occur outside of these currently identified basins. There are water-bearing geologic units within ground water basins in the Region that do not meet the definition of an aquifer. Therefore, for basin planning and regulatory purposes, the term "ground water" includes all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations, whether or not these waters meet the definition of an aquifer or occur within identified ground water basins.

Sacramento River Basin

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. For planning purposes, this includes all watersheds tributary to the Sacramento River that are north of the Cosumnes River watershed. It also includes the closed basin of Goose Lake and drainage sub-basins of Cache and Putah Creeks.

The principal streams are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creeks to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

DWR Bulletin 118-80 identifies 63 ground water basins in the Sacramento watershed area. The Sacramento Valley floor is divided into 2 ground water basins. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses.

San Joaquin River Basin

The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River. It includes all watersheds tributary to the San Joaquin River and the Delta south of the Sacramento River and south of the American River watershed. The southern planning boundary is described in the first paragraph of the previous page.

The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

DWR Bulletin 118-80 identifies 39 ground water basins in the San Joaquin watershed area. The San Joaquin Valley floor is divided into 15 separate ground water basins, largely based on political considerations. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses..

GRASSLAND WATERSHED

The Grassland watershed is a valley floor sub-basin of the San Joaquin River Basin. The portion of the watershed for which agricultural subsurface drainage policies and regulations apply covers an area of approximately 370,000 acres and is bounded on the north by the alluvial fan of Orestimba Creek and by the Tulare Lake Basin to the south. The San Joaquin River forms the eastern boundary and Interstate Highway 5 forms the approximate western boundary. The San Joaquin River forms a wide flood plain in the region of the Grassland watershed.

The hydrology of the watershed has been irreversibly altered due to water projects and is presently governed by land uses. These uses are primarily, managed wetlands and agriculture. The wetlands form important waterfowl habitat for migratory waterfowl using the Pacific Flyway. The alluvial fans of the western and southern portions of the watershed contain salts and selenium which can be mobilized through irrigation practices and can impact beneficial uses of surface waters and wetlands if not properly regulated.

II. EXISTING AND POTENTIAL BENEFICIAL USES

Note: Only those sections of the Existing and Potential Beneficial Uses Chapter with additions (highlighted text) are presented here. A row of asterisks indicates where sections of the Chapter have not been included.

Beneficial uses are critical to water quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to) "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)). Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning.

Significant points concerning the concept of beneficial uses are:

1. All water quality problems can be stated in terms of whether there is water of sufficient quantity or quality to protect or enhance beneficial uses.

2. Beneficial uses do not include all of the reasonable uses of water. For example, disposal of wastewaters is not included as a beneficial use. This is not to say that disposal of wastewaters is a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses. Similarly, the use of water for the dilution of salts is not a beneficial use although it may, in some cases, be a reasonable and desirable use of water.

3. The protection and enhancement of beneficial uses require that certain quality and quantity objectives be met for surface and ground waters.

4. Fish, plants, and other wildlife, as well as humans, use water beneficially.

Beneficial use designation (and water quality objectives, see Chapter III) must be reviewed at least once during each three-year period for the purpose of modification as appropriate (40 CFR 131.20).

* * * * *

Surface Waters

Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams. In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied.

It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

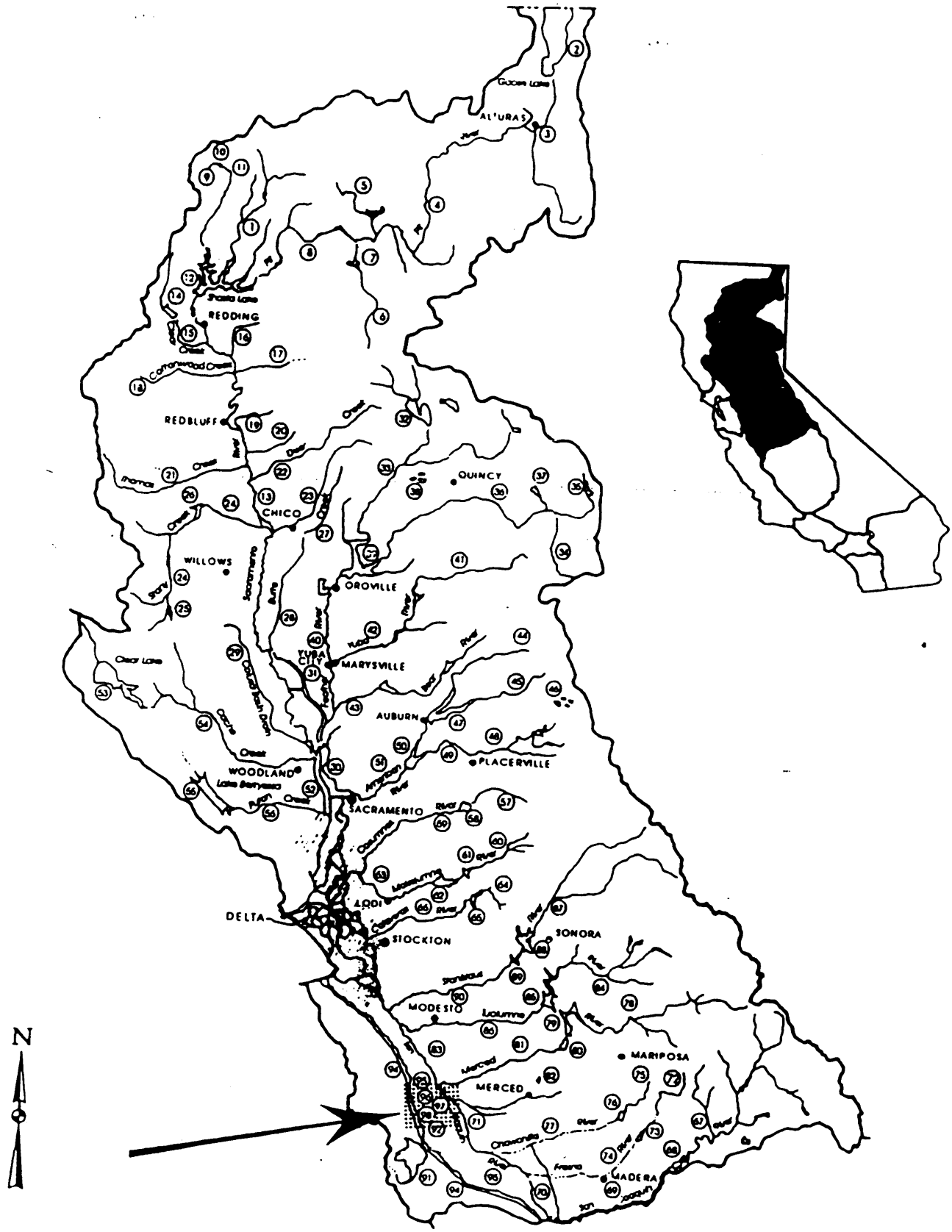
Water Bodies within the basins that do not have beneficial uses designated in Table II-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan. These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies.

In making any exemptions to the beneficial use designation of MUN, the Regional Board will apply the exceptions listed in Resolution 88-63 (Appendix Item 8).

* * * * *

FIGURE II-1

SURFACE WATER BODIES AND BENEFICIAL USES



TABL

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	MUN	AGRI-CULTURE		INDUSTRY			RECREATION			FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV
				AGR		PROC	IND	POW	REC-1		REC-2	WARM	COLD	MIGR		SPWN			
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING (1) AND RAFTING	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)	WARM (3)	COLD (4)	WILDLIFE HABITAT	NAVIGATION
1	McCLOUD RIVER	505.	E					E	E	P	E		E				E	E	
2	GOOSE LAKE	527.20		E	E				E		E	E	E					E	
	PIT RIVER																		
3	NORTH FORK, SOUTH FORK, PIT RIVER	526.00	E	E	E				E	P	E	E	E			E	E	E	
4	CONFLUENCE OF FORKS TO HAT CREEK	526.35	E	E	E			E	E	E	E	E	E			E		E	
5	FALL RIVER	526.41	E	E	E			E	E	E	E	E	E					E	
6	HAT CREEK	526.30		E				E	E		E	E	E				E	E	
7	BAUM LAKE	526.34						E	E		E		E				P	E	
8	MOUTH OF HAT CREEK TO SHASTA LAKE	526.	E	E	E			E	E	E	E	P	E			E	E	E	
	SACRAMENTO RIVER																		
9	SOURCE TO BOX CANYON RESERVOIR	525.22		E	E				E		E		E					E	
10	LAKE SISKIYOU	525.22							E		E	E	E				P	E	
11	BOX CANYON DAM TO SHASTA LAKE	525.2		E	E				E	E	E		E				E	E	
12	SHASTA LAKE	506.10	E	E				E	E		E	E	E			E	E	E	
13	SHASTA DAM TO COLUSA BASIN DRAIN		E	E	E		E	E	E	E	E	E	E	E	E	E	E	E	E
14	WHISKEY TOWN RESERVOIR	524.81	E	E	E			E	E		E	E	E			E		E	
15	CLEAR CREEK BELOW WHISKEYTOWN RESERVOIR	524.82	E	E	E				E	E	E	E	E		E	E	E	E	
16	COW CREEK	507.3	P	E	E			E	E	P	E		E		E	E	E	E	
17	BATTLE CREEK	507.12		E	E			E	E	E	E	E	E		E	E	E	E	
18	COTTONWOOD CREEK	524.3	E	E	E	P	P	P	E	E	E	E	E		E	E	E	E	
19	ANTELOPE CREEK	509.63	E	E	E				E		E	E	E		E	E	E	E	
20	MILL CREEK	509.42	E	E	E				E		E	E	E		E	E	E	E	
21	THOMES CREEK	523.10		E	E			P	E		E	E	E		E	E	E	E	
22	DEER CREEK	509.20	E	E	E				E	E	E	E	E		E	E	E	E	
23	BIG CHICO CREEK	509.14		E	E				E	E	E	E	E		E	E	E	E	
24	STONY CREEK	522.00		E	E				E	E	E	E	P		E	E	E	E	
25	EAST PARK RESERVOIR	522.33							E		E	E	P			E		E	
26	BLACK BUTTE RESERVOIR	522.12		E	E				E		E	E				E		E	
	BUTTE CREEK																		
27	SOURCES TO CHICO	521.30	E	E	E			L	E			E	E		E	E	E	E	
28	BELOW CHICO, INCLUDING BUTTE SLOUGH	520.40		E	E				E	E		E	E		E	E		E	
29	COLUSA BASIN DRAIN	520.21		E	E				E	E		E	P	E		E		E	

LEGEND
E = EXISTING BENEFICIAL USES
P = POTENTIAL BENEFICIAL USES
L = EXISTING LIMITED BENEFICIAL USE

NOTE:
Surface waters with the beneficial uses of Groundwater Recharge (GWR), Freshwater Replenishment (FRSH), and Preservation of Rare and Endangered Species (RARE) have not been identified in this plan. Surface waters of the Sacramento and San Joaquin River Basins falling within these beneficial use categories will be identified in the future as part of the continuous planning process to be conducted by the State Water Resources Control Board.

* * * * *

TABLE II (cont'd)

SURFACE WATER BOL . AND BENEFICIAL USES

	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	MUN	AGRI-CULTURE		INDUSTRY			RECREATION			FRESHWATER HABITAT (2)		MIGRATION		SPAWNING		WILD	NAV
				AGR		PROC	IND	POW	REC-1		REC-2	WARM	COLD	MIGR		SPWN			
			MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING (1) AND RAFTING	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)	WARM (3)	COLD (4)	WILDLIFE HABITAT	NAVIGATION
78	MERCED RIVER																		
79	SOURCE TO McCLURE LAKE	537.	P	E				E	E	E	E	E	E					E	
80	McCLURE LAKE	537.22	P	E				E	E		E	E	E					E	
81	McSWAIN RESERVOIR	537.1	P	E				E	E		E	E	E					E	
82	McSWAIN RESERVOIR TO SAN JOAQUIN RIVER	535.	E		E	E	E	E	E	E	E	E	E	E	E	E	E	E	
83	YOSEMITE LAKE	535.9							E		E	E	E					E	
	MOUTH OF MERCED RIVER TO VERNALIS	535/541	P	E	E	E			E	E	E	E	E	E	E	E	E	E	
	TUOLUMNE RIVER																		
84	SOURCE TO [NEW] DON PEDRO RESERVOIR	536.	E	E	E			E	E	E	E	E	E					E	
85	NEW DON PEDRO RESERVOIR	536.32	P					E	E		E	E	E					E	
86	NEW DON PEDRO DAM TO SAN JOAQUIN RIVER	535.	P	E	E				E	E	E	E	E		E	E	E	E	
	STANISLAUS RIVER																		
87	SOURCE TO NEW MELONES RESERVOIR (PROPOSED)	534.	E	E	E			E	E	E	E	E	E					E	
88	NEW MELONES RESERVOIR	534.21	E	E	E			E	E		E	E	E					E	
89	TULLOCH RESERVOIR	534.22	P	E	E			E	E		E	E						E	
90	GOODWIN DAM TO SAN JOAQUIN RIVER	535.	P	E	E	E	E	E	E	E	E	E	E		E	E	E	E	
91	SAN LUIS RESERVOIR	542.32	E	E	E		E	E	E		E	E						E	
92	O'NEILL RESERVOIR	541.2	E	E	E				E		E	E						E	
93	OTHER LAKES AND RESERVOIRS IN SAN JOAQUIN R. BASIN, (EXCLUDING HYDRO UNIT NOS. 531-533, 543, 544) (6)		E					E	E		E	E	E				E	E	
94	CALIFORNIA AQUEDUCT	541.	E	E	E	E	E	E	E		E	E	E					E	
95	DELTA-MENDOTA CANAL	541/543	E	E	E				E		E	E						E	
	GRASS AND WATERSHED [a]	541.20							E		E	E						E	
96	MUD SLOUGH (NORTH)			L[b]	E				E		E	E				E		E	
97	SALT SLOUGH			E	E				E		E	E				E		E	
98	WETLAND WATER SUPPLY CHANNELS ([c])			L[b]	E				E		E	L[c]						E	
A	SACRAMENTO SAN JOAQUIN DELTA (8, 9)	544.	E	E	E	E	E		E	E	E	E	E	E	E	E		E	E

(1) Shown for streams and rivers only with the implication that certain flows are required for this beneficial use.

(2) Reservoir does not include anadromous. Any segments with both COLD and WARM beneficial use designations will be considered COLD water bodies for the application of water quality objectives.

(3) Striped bass, sturgeon, and shad.

(4) Salmon and steelhead.

(5) As a primary beneficial use.

(6) The indicated beneficial uses are to be protected for all waters except in specific cases where evidence indicates the appropriateness of additional or alternative beneficial use designations.

(7) Sport fishing is the only recreation activity permitted.

(8) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis.

(9) Per State Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2.

(10) Wetland water supply channels for which beneficial uses are designated are defined in Appendix 4G.

[a] The following beneficial uses EXIST in addition to those noted in Table II-1:

Mud Slough (north): COMM and SHELL
Salt Slough: COMM, BIOL, and SHELL
Wetland Water Supply Channels: BIOL

[b] Elevated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use.

[c] Wetland channels can sustain aquatic life, but due to fluctuating flow regimes and habitat limitations, may not be suitable for rearing and/or propagation.

Note: Only those sections of the Water Quality Objectives Chapter with additional (highlighted text) are presented here. A row of asterisks indicates where sections of the Chapter have not been included.

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" [Water Code Section 13050(h)]. It also requires the Regional Water Board to establish water quality objectives, while acknowledging that it is possible for water quality to be changed to some degree without unreasonably affecting beneficial uses. In establishing water quality objectives, the Regional Water Board must consider, among other things, the following factors:

- Past, present, and probable future beneficial uses;
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region;
- The need to develop and use recycled water. (Water Code Section 13241)

The Federal Clean Water Act requires a state to submit for approval of the Administrator of the U.S. Environmental Protection Agency *(USEPA)* all new or revised water quality standards which are established for surface and ocean waters. As noted earlier, California water quality standards consist of both beneficial uses (identified in Chapter II) and the water quality objectives based on those uses.

There are seven important points that apply to water quality objectives.

The first point is that water quality objectives can be revised through the basin plan amendment process. Objectives may apply region-wide or be specific to individual water bodies or parts of water bodies. Site-specific objectives may be developed whenever the Regional Water Board believes they are appropriate. As indicated previously, federal regulations call for each state to review its water quality standards at least every three years. These Triennial Reviews provide one opportunity to evaluate changing water quality objectives, because they begin with an identification of potential and actual water quality problems, i.e., beneficial use impairments. Since impairments may be associated with water quality objectives being exceeded, the Regional Water Board uses the results of the Triennial Review to implement actions to assess, remedy, monitor, or otherwise address the impairments, as appropriate, in order to achieve objectives and protect beneficial uses. If a problem is found to occur because, for example, a water quality objective is too weak to protect beneficial uses, the Basin Plan should be amended to make the objective more stringent. (Better enforcement of the water quality objectives or adoption of certain policies or redirection of staff and resources may also be proper responses to water quality problems. See the Implementation chapter for further discussion.)

Changes to the objectives can also occur because of new scientific information on the effects of water contaminants. A major source of information is the USEPA which develops data on the effects of chemical and other constituent concentrations on particular aquatic species and human health. Other information sources for data on protection of beneficial uses include the National Academy of Science which has published data on bioaccumulation and the Federal Food and Drug Administration which has issued criteria for unacceptable levels of chemicals in fish and shellfish used for human consumption. The Regional Water Board may make use of those and other state or federal agency information sources in assessing the need for new water quality objectives.

The second point is that achievement of the objectives depends on applying them to controllable water quality factors. *Controllable water quality factors* are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or the Regional Water Board,

and that may be reasonably controlled. Controllable factors are not allowed to cause further degradation of water quality in instances where uncontrollable factors have already resulted in water quality objectives being exceeded. The Regional Water Board recognizes that man made changes that alter flow regimes can affect water quality and impact beneficial uses.

The third point is that objectives are to be achieved primarily through the adoption of waste discharge requirements (including permits) and cleanup and abatement orders. When adopting requirements and ordering actions, the Regional Water Board considers the potential impact on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. It can then make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives. The objectives contained in this plan, and any State or Federally promulgated objectives applicable to the basins covered by the plan, are intended to govern the levels of constituents and characteristics in the main water mass unless otherwise designated. They may not apply at or in the immediate vicinity of effluent discharges, but at the edge of the *mixing zone* if areas of dilution or criteria for diffusion or dispersion are defined in the waste discharge specifications.

The fourth point is that the Regional Water Board recognizes that immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the USEPA, may not be feasible in all circumstances. Where the Regional Water Board determines it is infeasible for a discharger to comply immediately with such objectives or criteria, compliance shall be achieved in the shortest practicable period of time (determined by the Regional Water Board), not to exceed ten years after the adoption of applicable objectives or criteria. This policy shall apply to water quality objectives and water quality criteria adopted after the effective date of this amendment to the Basin Plan [25 September 1995].

The fifth point is that in cases where water quality objectives are formulated to preserve historic conditions, there may be insufficient data to determine completely the temporal and hydrologic variability representative of historic water quality. When violations of such objectives occur, the Regional Water Board judges the reasonableness of achieving those objectives through regulation of the controllable factors in the areas of concern.

The sixth point is that the State Water Board adopts policies and plans for water quality control which can specify water quality objectives or affect their implementation. Chief among the State Water Board's policies for water quality control is State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California). It requires that wherever the existing quality of surface or ground waters is better than the objectives established for those waters in a basin plan, the existing quality will be maintained unless as otherwise provided by Resolution No. 68-16 or any revisions thereto. This policy and others establish general objectives. The State Water Board's water quality control plans applicable to the Sacramento and San Joaquin River Basins are the Thermal Plan and Water Quality Control Plan for Salinity. The Thermal Plan and its water quality objectives are in the Appendix. The Water Quality Control Plan for Salinity water quality objectives are listed as Table III-5. The State Water Board's plans and policies that the Basin Plan must conform to are addressed in Chapter IV, Implementation.

The seventh point is that water quality objectives may be in numerical or narrative form. The enumerated milligram-per-liter (mg/l) limit for copper is an example of a numerical objective; the objective for color is an example of a narrative form.

Information on the application of water quality objectives is contained in the section, *Policy for Application of Water Quality Objectives*, in Chapter IV.

WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS

The objectives below are presented by categories which, like the Beneficial Uses of Chapter II, were standardized for uniformity among the Regional Water Boards. The water quality objectives apply to all surface waters in the Sacramento and San Joaquin River Basins, including the Delta, or as noted. *(The legal boundary of the Delta is contained in Section 12220 of the Water Code and identified in Figure III-1.)* The numbers in parentheses following specific water bodies are keyed to Figure II-1.

* * * * *

Chemical Constituents

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. The chemical constituent objectives in Table III-1 apply to the water bodies specified. Metal objectives in the table are dissolved concentrations. Selenium, molybdenum, and boron objectives are total concentrations. Water quality objectives are also contained in the Water Quality Control Plan for Salinity, adopted by the State Water Board in May 1991.

At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Regional Water Board may apply limits more stringent than MCLs.

TABLE III-1
TRACE ELEMENT WATER QUALITY OBJECTIVES

CONSTITUENT	MAXIMUM CONCENTRATION [a] (mg/l)	APPLICABLE WATER BODIES
Arsenic	0.01	Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13, 30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento-San Joaquin Delta.
Barium	0.1	As noted above for Arsenic.
Boron	2.0 (15 March through 15 September) 0.8 (monthly mean, 15 March through 15 September) 2.6 (16 September through 14 March) 1.0 (monthly mean, 16 September through 14 March) 1.3 (monthly mean, critical year[b]) 5.8 [c] 2.0 (monthly mean, 15 March through 15 September) [c]	San Joaquin River, mouth of the Merced River to Vernalis Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
Cadmium	0.00022 [d]	Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City.
Copper	0.0056 [d] 0.01 [e]	As noted above for Cadmium. As noted above for Arsenic. [e]

TABLE III-1 TRACE ELEMENT
WATER QUALITY OBJECTIVES
(Continued)

CONSTITUENT	MAXIMUM CONCENTRATION[a] (mg/l)	APPLICABLE WATER BODIES
Cyanide	0.01	As noted above for Arsenic.
Iron	0.3	As noted above for Arsenic.
Manganese	0.05	As noted above for Arsenic.
Molybdenum	0.015 0.010 (monthly mean)	San Joaquin River, mouth of the Merced River to Vernalis
	0.050 [c] 0.019 (monthly mean) [c]	Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
Selenium	0.012 0.005 (4-day average) [f]	San Joaquin River, mouth of the Merced River to Vernalis
	0.020 [f] 0.005 (4-day average) [f]	Mud Slough (north), and the San Joaquin River from Sack Dam to the mouth of Merced River
	0.020 0.002 (monthly mean)	Salt Slough and constructed and re-constructed water supply channels in the Grasslan watershed listed in Appendix 40
Silver	0.01	As noted above for Arsenic.
Zinc	0.1 *	As noted above for Arsenic. *
	0.016 [d]	As noted above for Cadmium.

a Metal objectives in this table are dissolved concentrations. Selenium, molybdenum, and boron objectives are total concentrations.

b See Table IV-3.

c No footnote applies

d The effects of these concentrations were measured by exposing test organisms to dissolved aqueous solutions of 40 mg/l hardness that had been filtered through a 0.45 micron membrane filter. Where deviations from 40 mg/l of water hardness occur, the objectives, in mg/l, shall be determined using the following formulas:

$$Cu = e^{(0.905)(\ln \text{hardness}) - 1.612} \times 10^{-3}$$

$$Zn = e^{(0.830)(\ln \text{hardness}) - 0.219} \times 10^{-3}$$

$$Cd = e^{(1.160)(\ln \text{hardness}) - 3.777} \times 10^{-3}$$

e Does not apply to Sacramento River above State Hwy. 32 bridge at Hamilton City. See relevant objectives (*) above.

f No footnote applies

Note: Only those sections of the Implementation Chapter with additions (highlighted text) are presented below. A row of asterisks indicates where sections of the Chapter have not been included.

The Porter-Cologne Water Quality Control Act states that basin plans consist of beneficial uses, water quality objectives and a program of implementation for achieving their water quality objectives [Water Code Section 13050(j)]. The implementation program shall include, but not be limited to:

1. A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private;

2. A time schedule for the actions to be taken; and,

3. A description of surveillance to be undertaken to determine compliance with the objectives (Water Code Section 13242).

In addition, State law requires that basin plans indicate estimates of the total cost and identify potential sources of funding of any agricultural water quality control program prior to its implementation. (Water Code Section 13141). This chapter of the Basin Plan responds to all but the surveillance requirement. That is described in Chapter V.

This chapter is organized as follows: The first section contains a general description of water quality concerns. These are organized by discharger type (e.g., agriculture, silviculture, mines, etc.). The second section lists programs, plans and policies which should result in the achievement of most of the water quality objectives in this plan. This section includes descriptions of State Water Board policies, statewide plans, statewide programs dealing with specific waste discharge problems (e.g., underground tanks, storm water, solid waste disposal sites, etc.), memoranda of understanding, management agency agreements, memoranda of agreement, Regional Water Board policies, a listing of Regional Water Board prohibition areas, and Regional Water Board guidelines addressing specific water quality problems. The third section contains recommendations for appropriate action by entities other than the Regional Water Board. The fourth section describes how; within the framework of the programs, plans and policies discussed in the second section; the Regional Water Board integrates water quality control activities into a continuing planning process. The fifth section identifies the current actions and the time schedule for future actions of the Regional Water Board to achieve compliance with water quality objectives where the programs, plans and policies in the second section are not adequate. The last section lists the estimated costs and funding sources for agricultural water quality control programs that are implemented by the Regional Water Board.

* * * * *

Control Action Considerations of the Central Valley Regional Water Board

Policies and Plans

The following policies were adopted, or are hereby adopted, by the Regional Water Board. The first four policies listed were adopted as part of the 1975 Basin Plan. Items 7 through 11 are new policies:

* * * * *

6. *Regional Water Board Resolution No. [redacted], San Joaquin River Agricultural Subsurface Drainage Policy*

   a. The control of toxic trace elements in agriculture subsurface drainage, especially selenium, is the first priority.

   b. The control of agricultural subsurface drainage will be pursued on a regional basis.

   c. The reuse of agricultural subsurface drainage will be encouraged, and actions

that would limit or prohibit ~~it~~ reuse discouraged.

d~~b~~. Of the two major options for disposal of salts produced by agricultural irrigation, export out of the basin is the favored option. The San Joaquin River may continue to be used to remove salts from the basin so long as water quality objectives are met.

e. The valley-wide drain to carry the salt generated by agricultural irrigation out of the valley remains the best technical solution to the water quality problems of the San Joaquin River and Tulare Lake Basins.

The Regional Water Board, at this time, feels that a valley-wide drain will be the only feasible, long-range solution for achieving a salt balance in the Central Valley. The Regional Water Board favors the construction of a valley-wide drain under the following conditions:

- All toxicants would be reduced to a level which would not harm beneficial uses of receiving waters.
- The discharge would be governed by specific discharge and receiving water limits in an NPDES permit.
- Long-term, continuous biological monitoring would be required.

f. Optimizing protection of beneficial uses on a watershed basis will guide the development of actions to regulate agricultural subsurface drainage discharges.

g. For regulation of selenium discharges, actions need to be focused on selenium load reductions.

* * * * *

Regional Water Board Prohibitions

The Porter-Cologne Water Quality Control Act allows the Regional Water Board to prohibit certain discharges (Water Code Section 13243).

Prohibitions may be revised, rescinded, or adopted as necessary. The prohibitions applicable to the Sacramento and San Joaquin River Basins are identified and described below. [NOTE: Costs incurred by any unit of local government for a new program or increased level of service for compliance with discharge prohibitions in the Basin Plan do not require reimbursement by the State per Section 2231 of the Revenue and Taxation Code, because the Basin Plan implements a mandate previously enacted by statute, Chapter 482, Statutes of 1969.]

* * * * *

6. *San Joaquin River Subsurface Agricultural Drainage*

a. The discharge of agricultural subsurface drainage from the Grassland watershed to the San Joaquin River or its tributaries from any on-farm subsurface drain, open drain, or similar drain system is prohibited, unless such discharge began prior to (the effective date of this amendment) or unless such discharge is governed by waste discharge requirements.

b. The discharge of agricultural subsurface drainage water to Salt Slough and wetland water supply channels identified in Appendix 40 is prohibited after 1 October 1996, unless water quality objectives for selenium are being met. This prohibition may be reconsidered if public or private interests prevent the implementation of a separate conveyance facility for agricultural subsurface drainage.

c. The discharge of agricultural subsurface drainage water to Mud Slough (north) and the San Joaquin River from Sack Dam to the mouth of the Merced River is prohibited after 1 October 2010, unless water quality objectives for selenium are being met. This prohibition may be reconsidered if public or private interests prevent the implementation of a separate conveyance facility for agricultural subsurface drainage to the San Joaquin River.

d. The discharge of selenium from agricultural subsurface drainage systems in the Grassland watershed to the San Joaquin

River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 1 October 1996.

e. Activities that increase the discharge of poor quality agricultural subsurface drainage are prohibited.

* * * * *

ACTIONS RECOMMENDED FOR IMPLEMENTATION BY OTHER ENTITIES

Consistent with the Porter-Cologne Water Quality Control Act, the Basin Plan may identify control actions recommended for implementation by agencies other than the Regional Water Board [Water Code Section 13242(a)].

Recommended for Implementation by the State Water Board

* * * * *

Subsurface Agricultural Drainage

1. The Regional Board will request that the State Water Board use its water rights authority to preclude the supplying of water to specific lands, if water quality objectives are not met by the specified compliance dates and Regional Board administrative remedies fail to achieve compliance.

2. The State Water Board should work jointly with the Regional Board in securing compliance with the 2 μg/l selenium objective for managed-wetlands in the Grassland area.

3. The State Water Board should also consider grant funds to implement a cost share program to install a number of flow monitoring stations within the Grassland area to assist in better defining the movement of pollutants through the area.

4. The State Water Board should continue to consider the Drainage Problem Area in the San Joaquin Basin and the upper Panoche watershed (in the Tulare Basin) as priority nonpoint source problems in order to make USEPA nonpoint source control funding available to the area.

5. The State Water Board should seek funding for research and demonstration of advanced technology that will be needed to achieve final selenium loads necessary to meet selenium water quality objectives.

* * * * *

Agricultural Drainage Facilities

Facilities should be constructed to convey agricultural drain water from the San Joaquin and Tulare Basins. It is the policy of the Regional Water Board to encourage construction. The discharge must comply with water quality objectives of the receiving water body.

Subsurface Agricultural Drainage

1. The entire drainage issue is being handled as a watershed management issue. The entities in the Drainage Problem Area and entities within the remainder of the Grassland watershed need to establish a regional entity with authority and responsibility for drain water management.

2. The regional drainage entity and agricultural water districts should consider adopting economic incentive programs as a component of their plans to reduce pollutant loads. Economic incentives can be an effective institutional means of promoting on-farm changes in drainage and water management.

3. If fragmentation of the parties that generate, handle and discharge agricultural subsurface drainage jeopardizes the achievement of water quality objectives, the Regional Board will consider petitioning the Legislature for the formation of a regional drainage district.

4. The Legislature should consider putting additional bond issues before the voters to provide low interest loans for agricultural water conservation and water quality projects and incorporating provisions that would allow recipients to be private landowners, and that would allow irrigation efficiency improvement projects that reduce drainage discharges to be

eligible for both water conservation funds and water quality facilities funds.

5. The San Joaquin Valley Drainage Implementation Program or other appropriate agencies should continue to investigate the alternative of a San Joaquin River Basin drain to move the existing discharge point for poor quality agricultural subsurface drainage to a location where its impact on water quality is less.

6. The selenium water quality objective for the wetland channels can not be achieved without removal of drainage water from these channels. The present use of the Grassland channels has developed over a 30-year period through agreements between the dischargers, water and irrigation districts, the U.S. Bureau of Reclamation, the California Department of Water Resources, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the Grassland Water District and the Grassland Resource Conservation District. Because each entity shared in the development of the present drainage routing system, each shares the responsibility for implementation of a wetlands bypass.

* * * * *

ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES

The Regional Water Board expects to implement the actions identified below over the fiscal year (FY) period 1993/1994 through 1995/1996. The problems to which the actions respond were identified as a result of the Regional Water Board's 1993 Triennial Review. The actions and schedules assume that the Regional Water Board has available a close approximation of the mix and level of resources it had in FY 1993/1994. The actions are identified by major water quality problem categories.

Agricultural Drainage Discharges in the San Joaquin River Basin

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled. Concentrations of boron, selenium, molybdenum and other trace elements have also increased. These increases are primarily due to reservoir development on the east side tributaries and upper basin for agricultural development, the use of poorer quality, higher salinity, Delta water in lieu of San Joaquin River water on west side agricultural lands and drainage from upslope saline soils on the west side of the San Joaquin Valley. The water quality degradation in the River was identified in the 1975 Basin Plan and the Lower San Joaquin River was classified as a Water Quality Limited Segment. At that time, it was envisioned that a Valley-wide Drain would be developed and these subsurface drainage water flows would then be discharged outside the Basin, thus improving River water quality. However, present day development is looking more toward a regional solution to the drainage water discharge problem rather than a valley-wide drain.

Because of the need to manage salt and other pollutants in the River, the Regional Water Board began developing a Regional Drainage Water Disposal Plan for the Basin. The development began in FY 87/88 when Basin Plan amendments were considered by the Water Board in FY 88/89. The amendment development process included review of beneficial uses, establishment of water quality objectives, and preparation of a regulatory plan, including a full implementation plan. The regulatory plan emphasized achieving objectives through reductions in drainage volumes and pollutant loads through best management practices and other on-farm methods. Additional regulatory steps will be considered based on achievements of water quality goals and securing of adequate resources.

The amendment emphasized toxic elements in subsurface drainage discharges. The Regional Water Board however still recognizes salt management as the most serious long-term issue on the San Joaquin River. The Regional Water Board will continue as an active participant in the San Joaquin River Management Program implementation phase, as authorized by AB 3048, to promote salinity management schemes including time discharge releases, real time monitoring and source control.

Per the amendment to the Basin Plan for San Joaquin River subsurface agricultural drainage, approved by the State Water Board in Resolution No. ~~89-88~~ _____ and incorporated herein, the following actions will be implemented.

1. In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.

2. Control actions which result in selenium load reduction are most effective in meeting water quality objectives.

3. With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.

4. Best management practices, such as water conservation measures, are applicable to the control of agricultural subsurface drainage.

5. Performance goals will be used to measure progress toward achievement of water quality objectives for selenium. Prohibitions of discharge and waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium. Compliance with performance goals and water quality objectives for nonpoint sources will occur no later than the dates specified in Table IV-4.

6. Waste discharge requirements will may be used to control agricultural subsurface drainage discharges containing selenium and may be used to control discharges containing other toxic trace elements.

7. Selenium load reduction requirements will be incorporated into waste discharge requirements as effluent limits as necessary to ensure that the selenium water quality objectives in the San Joaquin River downstream of the Merced River inflow is achieved. The Board intends to implement a TMDL after review.

8. Selenium effluent limits established in waste discharge requirements will be applied to the discharge of subsurface drainage water from the Grassland watershed. In the absence of a regional entity to coordinate actions on the discharge, the Regional Board will consider setting the effluent limits at each drainage water source (discharger) to ensure that beneficial uses are protected at all points downstream.

9. Upslope irrigations and water facility operators whose actions contribute to subsurface drainage flows will participate in the program to control discharges.

Table IV-4. Compliance Time Schedule for Meeting the 4-day Average and Monthly Mean Water Quality Objective for Selenium

Selenium Water Quality Objectives (in bold) and Performance Goals (in italics)

Water Body/Water Year Type[1]	1 October 1996	1 October 2002	1 October 2005	1 October 2010
Salt Slough and Wetland Water Supply Channels listed in Appendix 40	***2 µg/L monthly mean***			
San Joaquin River below the Merced River, Above Normal and Wet Water Year types[1]		*5 µg/L monthly mean*	**5 µg/L 4-day avg.**	
San Joaquin River below the Merced River, Critical, Dry, and Below Normal Water Year types		*8 µg/L monthly mean*	*5 µg/L monthly mean*	**5 µg/L 4-day avg.**
Mud Slough (north) and the San Joaquin River from Sack Dam to the Merced River				**5 µg/L 4-day avg.**

[1] The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification at the 75% exceedance level (Department of Water Resources Bulletin 120). The previous water year's classification will apply until an estimate is made of the current water year.

10. Public and private managed-wetlands will participate in the program to achieve water quality objectives.

11. Achieving reductions in the load of selenium discharged is highly dependent upon the effectiveness of individual actions or technology not currently available; therefore, the Regional Board will review the waste discharge requirements and compliance schedule at least every 5 years.

12. All those discharging or contributing to the generation of agricultural subsurface drainage will be required to submit for approval a short-term (5-year) drainage management plan designed to meet interim milestones and a long-term drainage management plan designed to meet final water quality objectives.

13. An annual review of the effectiveness of control actions taken will be conducted by those contributing to the generation of agricultural subsurface drainage.

14. Evaporation basins in the San Joaquin Basin will be required to meet minimum design standards, have waste discharge requirements and be part of a regional plan to control agricultural subsurface drainage.

15. The Regional Board staff will coordinate with US EPA and the dischargers on a study plan to support the development of a site specific selenium water quality objective for the San Joaquin River and other effluent dominated waterbodies in the Grassland watershed.

16. The Regional Board will establish water quality objectives for salinity for the San Joaquin River.

* * * * *

ESTIMATED COSTS OF AGRICULTURAL WATER QUALITY CONTROL PROGRAMS AND POTENTIAL SOURCES OF FINANCING

SAN JOAQUIN RIVER SUBSURFACE AGRICULTURAL DRAINAGE CONTROL PROGRAM

The estimates of capital and operational costs to achieve the selenium objective for the San Joaquin River range from $3.6 million/year to $27.4 million/year (1990 dollars). The cost of meeting water quality objectives in Mud Slough (north), Salt Slough, and the wetland supply channels is approximately $2.7 million /year (1990 dollars).

Potential funding sources include:

1. Private financing by individual sources.

2. Bonded indebtedness or loans from governmental institutions.

3. Surcharge on water deliveries to lands contributing to the drainage problem.

4. Ad Valorem tax on lands contributing to the drainage problem.

5. Taxes and fees levied by a district created for the purpose of drainage management.

6. State or federal grants or low-interest loan programs.

7. Single-purpose appropriations from federal or State legislative bodies (including land retirement programs).

* * * * *

V. SURVEILLANCE AND MONITORING

This chapter describes the methods and programs that the Regional Water Board uses to acquire water quality information. Acquisition of data is a basic need of a water quality control program and is required by both the Clean Water Act and the Porter-Cologne Water Quality Control Act.

The Regional Water Board's surveillance and monitoring efforts include different types of sample collection and analysis. Surface water surveillance may involve analyses of water, sediment, or tissue samples and ground water surveillance often includes collection and analysis of soil samples. Soil, water, and sediment samples are analyzed via standard, EPA approved, laboratory methods. The Regional Water Board addresses quality assurance through bid specifications and individual sampling actions such as submittal of split, duplicate, or spiked samples and lab inspections.

Although surveillance and monitoring efforts have traditionally relied upon measurement of key chemical/physical parameters (e.g., metals, organic and inorganic compounds, bacteria, temperature, and dissolved oxygen) as indicators of water quality, there is increasing recognition that close approximation of water quality impacts requires the use of biological indicators. This is particularly true for regulation of toxic compounds in surface waters where standard physical/chemical measurement may be inadequate to indicate the wide range of substances and circumstances able to cause toxicity to aquatic organisms. The use of biological indicators to identify or measure toxic discharges is often referred to as *biotoxicity testing*. EPA has issued guidelines and technical support materials for biotoxicity testing. A key use of the method is to monitor for compliance with narrative water quality objectives or permit requirements that specify that there is to be no discharge of toxic materials in toxic amounts. The Regional Water Board will continue to use biotoxicity procedures and testing in its surveillance and monitoring program.

As discussed previously, the protection, attainment, and maintenance of beneficial uses occur as part of a continuing cycle of identifying beneficial use impairments, applying control measures, and assessing program effectiveness. The Regional

Water Board surveillance and monitoring program provides for the collection, analysis, and distribution of the water quality data needed to sustain its control program. Under ideal circumstances, the Regional Water Board surveillance and monitoring program would produce information on the frequency, duration, source, extent, and severity of beneficial use impairments. In attempting to meet this goal, the Regional Water Board relies upon a variety of measures to obtain information. The current surveillance and monitoring program consists primarily of seven elements:

Data Collected by Other Agencies

The Regional Water Board relies on data collected by a variety of other agencies. For example, the Department of Water Resources (DWR) has an ongoing monitoring program in the Delta and the United States Geological Survey (USGS) and DWR conduct monitoring in some upstream rivers. The Department of Fish and Game, Fish and Wildlife Service, USGS, and Department of Health Services also conduct special studies and collect data.

Regional Water Board and State Water Board Monitoring Programs

The State Water Board manages its own Toxic Substances Monitoring (*TSM*) program to collect and analyze fish tissue for the presence of bioaccumulative chemicals. The Regional Water Board participates in the selection of sampling sites for its basins and annually is provided with a report of the testing results.

Special Studies

Intensive water quality studies provide detailed data to locate and evaluate violations of receiving water standards and to make waste load allocations. They usually involve localized, frequent and/or continuous sampling. These studies are specially designed to evaluate problems in potential water quality limited segments, areas of special biological significance or hydrologic units requiring sampling in addition to the routine collection efforts.

One such study is the *San Joaquin River Subsurface Agricultural Drainage Monitoring Program*. The program includes the following tasks:

1. The dischargers will monitor discharge points and receiving waters for constituents of concern and

flow (discharge points and receiving water points only).

2. The Regional Board will inspect discharge flow monitoring facilities and will continue its cooperative effort with dischargers to ensure the quality of laboratory results.

3. The Regional Board will, on a regular basis, inspect any facilities constructed to store or treat agricultural subsurface drainage.

4. The Regional Board will continue to maintain and update its information on agricultural subsurface drainage facilities in the Grassland watershed. Efforts at collecting basic data on all facilities, including flow estimates and water quality will continue.

5. The Regional Water Board, in cooperation with other agencies, will regularly assess water conservation achievements cost of such efforts and drainage reduction effectiveness information. In addition, in cooperation with the programs of other agencies and local district managers, the Regional Board will gather information on irrigation practices, i.e., irrigation efficiency, pre-irrigation efficiency, excessive deep percolation and on seepage losses.

Aerial Surveillance

Low-altitude flights are conducted primarily to observe variations in field conditions, gather photographic records of discharges, and document variations in water quality.

Self-Monitoring

Self-monitoring reports are normally submitted by the discharger on a monthly or quarterly basis as required by the permit conditions. They are routinely reviewed by Regional Water Board staff.

Compliance Monitoring

Compliance monitoring determines permit compliance, validates self-monitoring reports, and provides support for enforcement actions. Discharger compliance monitoring and enforcement actions are the responsibility of the Regional Water Board staff.

Complaint Investigation

Complaints from the public or governmental agencies regarding the discharge of pollutants or creation of nuisance conditions are investigated and pertinent information collected.

APPENDIX DIRECTORY (continued)

* Appendix items are paginated by: item number/item page/item total pages

Appendix 40 - Grassland Watershed Wetland Channels for Which Beneficial Uses Have Been Identified

Southern Grassland Wetland Channels

	Starting Location	Ending Location
Agatha Canal North	Starts at the Agatha North/Geis split at NE1/4, SE1/4, SE1/4, Sec. 12, T11S, R11E	Discharges to the Santa Fe Canal at Mueller Weir at NW1/4, SW1/4, SW1/4, Sec. 21, T10S, R11E
Agatha Canal South	Diversion from Helm or Main Canal at NW1/4, SE1/4, NE1/4, Sec. 31 T11S, R12E	Terminates at the Agatha North/Geis split at NE1/4, SE1/4, SE1/4, Sec. 12, T11S, R11E
Almadan Ditch	Begins at the Agatha Canal at Mallard Rd at SE1/4, NE1/4, SE1/4, Sec. 12, T11S, R11E	Terminates at Mesquite Drain siphon at the SW1/4, SW1/4, SW1/4, Sec. 11, T11E, R11E
Almond Drive Ditch	Diversions from the Main Canal and Main Drain at the SW1/4, SW1/4, SW1/4, Sec. 6, T11S, R10E	Discharges to Reedly Ditch at SW1/4, SW1/4, SW1/4, Sec. 5, T11S, R10E
Ascot Ditch	Diversion from the Main Canal at the SE1/4, SW1/4, SW1/4, Sec. 7, T11S, R11E	Terminates at the SW1/4, SE1/4, SE1/4, Sec. 8, T11S, R11E
Britto Ditch	Diversion from Camp 13 at the NW1/4, SE1/4, NE1/4, Sec. 22, T11S, R11E	Terminates at the SW1/4, SE1/4, NE1/4, Sec. 10, T11S, R11E
Camp 13	Diversion of the Main Canal or Main Drain or Hamburg Drain at the SW1/4, SE1/4, SE1/4, Sec. 27, T11S, R11E.	Discharges to Mud Slough (south) at the SE1/4, NE1/4, NE1/4, Sec. 33, T10S, R11E
Charleston Drain	Freshwater diversions from the Outside Canal at the SW1/4, SW1/4, NE1/4, Sec. 32, T11S, R11E	Discharges to Upper Gadwall Ditch at the SW1/4, SW1/4, NW1/4, Sec. 6, T11S, R11E
Cocke Ditch	Diversion from the Arroyo Canal at the NE1/4, SW1/4, SW1/4, Sec. 21, T10S, R11E	Terminates at the NW1/4, SE1/4, SE1/4, Sec. 16, T10S, R11E
Colony Branch 2	Enters the Southern Grassland at the SW1/4, NW1/4, SW1/4, Sec. 8, T11S, R12E	Drains into Bennett Drain at the NE1/4, SE1/4, NE1/4, Sec. 7, T11S, R12E
Colony Branch 3/Bennett	Enters the Southern Grassland at the SE1/4, SW1/4, SW1/4, Sec. 5, T11S, R12E	Terminates at the Agatha Canal North at the SW1/4, SW1/4, SW1/4, Sec. 6 T11S, R12E
Cotton Drain	Enters the Grasdand at the NW1/4, NE1/4, SE1/4, Sec. 32, T10S, R11E	Discharges to Mud Slough (s) at the SE1/4, SW1/4, SE1/4, Sec. 28, T10S, R11E

	Starting Location	Ending Location
Flyway Ditch	Diversion from Almond Dr. Ditch at SE1/4, SW1/4, SW1/4, Sec. 5 / T11S, R11E	Discharges to Cotton Drain at the NW1/4, SE1/4, NE1/4, Sec. 32, T10S, R11E
Gables Ditch	Diversion of Main Canal at the NE1/4, NW1/4, NW1/4, Sec. 31, T11S, R12E	Terminates at the SW1/4, NW1/4, SW1/4, Sec. 18, T11S, R12E
Geis Ditch	Begins at the Agatha North/Geis split at the NE1/4, SE1/4, SE1/4, Sec. 12, T11S, R11E	Discharges to Camp 13 at NW1/4, NW1/4, SW1/4, Sec. 3, T11S, R11E
Helm Canal	Takeouts from the Main Canal at NE1/4, SE1/4, NE1/4, Sec. 31, T11S, R11E	Terminates at the Helm Canal extension at the SW1/4, SW1/4, NW1/4, Sec. 26, T11S, R11E
Line Ditch	Enters Grassland at the SW1/4, SE1/4, NE1/4, Sec. 5, T11S, R12E	Terminates at the NE1/4, NE1/4, NE1/4, Sec. 6, T11S, R12E
Lower Gadwall Canal	Continuation of the upper Gadwall, starts at the Almond Dr. intersection at the SE1/4, SE1/4, SE1/4, Sec. 5, T11S, R11E	Discharges to Mud Slough (south) at the NE1/4, NE1/4, NW1/4, Sec. 33, T10S, R11E
Meyers Ditch	Diversion from Helm Canal at SE1/4, SW1/4, SW1/4, Sec. 26, T11S, R11E	Terminates at the SE1/4, SW1/4, SW1/4, Sec. 23, T11S, R11E
Mud Slough (south)	Begins at the end of Camp 13 at the SE1/4, NE1/4, NE1/4, Sec. 33, T10S, R11E	Discharges to Salt Slough at the Los Banos WA at the NW1/4, NE1/4, SW1/4, Sec. 18, T9S, R10E
Pozo Drain	Enters the GWD at SW1/4, SW1/4, SW1/4, Sec. 8, T11S, R12E	Discharges to the Agatha Canal North at the NE1/4, SE1/4, NE1/4 Sec. 12, T11S, R12E
Reedly Ditch	Continuation of Almond Dr. Drain at the SW1/4, SW1/4, SW1/4, Sec. 4, T11S, R11E	Discharges to Camp 13 at the SE1/4, SE1/4, SE1/4, Sec. 4, T11S, R11E
San Pedro Canal	Diversion from the Arroyo Canal at the NW1/4, NE1/4, NW1/4, Sec. 26, T10S, R11E	Discharges to Boundary/ Devon Drain at the NE1/4, NE1/4, SE1/4, Sec. 31, T9S, R11E
SLCC Arroyo Canal	Enters the Southern Grassland at the NE1/4, SE1/4, NE1/4, Sec. 25, T10S, R11E	Discharges to the Santa Fe Canal at Mueller Weir at the NW1/4, SW1/4, SW1/4, Sec. 21, T10S, R11E
Sorsky Ditch	Diversion of Camp 13 and continuation of Sorsky Bypass at the NE1/4, NW1/4, NW14, Sec. 27, T11S, R11E	Discharges to Camp 13 at SW1/4, SW1/4, SW1/4, Sec. 3 T11S, R11E
Stillbow Ditch	Begins at Bennet Ditch at the SW1/4, SE1/4, SW1/4, Sec. 6, T11S, R12E	Discharges to the Agatha Canal North at the SW1/4, NW1/4, NW1/4, Sec. 36, T10S, R11E
240 Ditch	Diversion from Helm Canal at NE1/4, NW1/4, NW1/4, Sec. 36, T11S, R11E	Termination at Sorsky Ditch at NE1/4, NW1/4, NE1/4, Sec. 23, T11S, R11E
Upper Gadwall Ditch	Diversion of Camp 13 at the NW1/4, SE1/4, SE1/4, Sec. 22, T11S, R11E	Terminates at Reedly Ditch at the NE1/4, NE1/4, NE1/4, Sec. 8, T11S, R11E

Northern Grassland Wetland Channels

	Starting Location	Ending Location
Eagle Ditch	Diversion of the Santa Fe Canal at the NE 1/4, SE 1/4, NE 1/4, Sec. 30, T.8S, R.10E	Discharges to Mud Slough (north) at the SW 1/4, SE 1/4, NE 1/4, Sec. 7, T.8S, R.9E
Fremont Ditch	Diversion from San Luis Canal at the SE 1/4, SW 1/4, SW 1/4, Sec. 35, T.8S, R.10E	Discharges to Mud Slough (north) at the NW 1/4, NW 1/4, NE 1/4, Sec. 20, T.8S, R.10
Garzas Creek	Enters Grassland Water District (GWD) at the intersection of Sections 22, 23, 26,27 T.8S, R.9E	Discharges to Los Banos Creek NE 1/4, NE 1/4, NE 1/4, Sec. 26, T.8S, R.9E
Gun Club Road Ditch	Diversion of Los Banos Cr at the intersections of Sections 13, 14, 23, 24, T.8S, R.9E	Terminates at Eagle Ditch at the SW 1/4, SE 1/4, SE 1/4, Sec. 13, T.8S, R.9E
Kesterson Ditch	Diversion of the Santa Fe Canal at the SE 1/4, SE 1/4, SW 1/4, Sec. 32, T.8S, R.10E	Terminates at the NW 1/4, NW 1/4, SE 1/4, Sec. 34, T.8S, R.10E
Los Banos Creek	Begins service at CCID Main Canal at the SE 1/4, SW 1/4, SW 1/4, Sec. 9, T.10S., R.10E	Discharges to Mud Slough (north) at the NE 1/4, NW 1/4, SW 1/4, Sec. 26, T.7S, R.9E
Mosquito Ditch	Diversion from the San Luis Wasteway at the NE 1/4, NW 1/4, NW 1/4, Sec. 19, T.9S, R.10E	Discharges to Los Banos Creek at NE 1/4, NE 1/4, SE 1/4, Sec. 6, T.9S, R10E
Rubino Ditch	Diversion of the San Luis Spillway at the SW 1/4, SE 1/4, SW 1/4, Sec. 17, T.9S, R.10E	Terminates at the NW 1/4, SW 1/4, SW 1/4, Sec. 8, T.9S, R.10E
San Luis Canal	Starts at a diversion of the Main Canal at NE 1/4, NW 1/4, SW 1/4, Sec. 36, T.10S, R.10E	NE 1/4, NE 1/4, SW 1/4, Sec. 5, T.8S, R.10E
San Luis Spillway Ditch	Diversion of the San Luis Wasteway at the intersections of Sections 17, 18, 19, 20, T.9S, R.10E	Discharges to the Santa Fe Canal at SE 1/4, SE 1/4, SW 1/4, Sec. 16, T.9S, R.10E
San Luis Wasteway[2]		
Standard Ditch	Diversion from San Luis Canal at the NE 1/4, SE 1/4, NE 1/4, Sec. 25, T.9S, R.10E	Terminates at the NE 1/4, NE 1/4, SW 1/4, Sec. 15, T.9S, R.10E
Santa Fe Canal[1]	Extension of the Arroyo Canal at Mueller Weir at the NW 1/4, SW 1/4, SW 1/4, Sec. 21, T.10S, R.11E	Terminates at a tributary of Mud Slough (north) at the SW 1/4, SW 1/4, SE 1/4, Sec. 7, T.8S, R.10E
Santa Fe Canal Extension	Diversion of the Santa Fe Canal at the SW 1/4, Sec. 7, T.8S, R.10E	
Westside Ditch	Diversion of Garzas Cr at the intersection of Sections 22, 23, 26, 27, T.8S, R.9E	Discharges to Los Banos Creek at the SE 1/4, NW 1/4, NW 1/4, Sec. 11, T.8S, R..9E

[1] Begins as an extension of the Arroyo Canal. Receives only SLCC operational spill water at this point.
[2] Source is the Delta-Mendota Canal.